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ZOOLOGY.

The Nervous System of Echinoderms.—The recent work of Jean Demoor and Marcellin Chapeaux on the nervous system of the *Asteracanthion rubens* is embodied in a paper published in Tidsch. Nederland. Dierk. Vereen, II Serie vol. iii. The subject is treated both from an anatomical and physiological point of view. It includes also a systematic account of the effect of poisons and of heat upon *Asteracanthion rubens.* The authors sum up their conclusions as follows:

"The nervous system of the star-fish is differentiated into two systems, the condensed and the diffused, between which however, one finds it difficult to draw a sharp distinction. The functions are however now specialized in this large group, for we have shown that the two nervous fields have a distinct and peculiar functional aspect. Each presenting a distinct activity, they divide between themselves the work which is appropriate to the life of relation. Owing to the close connection which exists between them, the two systems can aid each other and work together for the accomplishment of the multiple manifestations induced by the different conditions external and internal, by the sensations arising from stimuli, and by reaction. To the diffused nervous system is attributed above all the role of perception and of sensation. It is the one that gives the organism a notion of its position and which informs it of its state of equilibrium. It is the one also which accumulating those diverse and vague organic impressions, which the physiologist groups under the name "kynetic," keeps the animal in constant activity and readiness to respond to stimuli.

"The motive impulses, properly speaking, the external manifestations of vital phenomena do not depend directly upon the diffused system. Their real centre is the condensed system which must then be the true organ of reactionary impulses. It is the centre in which are generated the reflex motions; it contains cell groups whose functions are definitely specialized, and which thus form the first traces of a more advanced type in which the different important manifestations of activity have become localized in distinct regions. The two nervous systems are intimately connected. The innumerable relations which unite them render their functional agreements close and each reinforces the other. From this last point of view a progressive specialization is also manifested. In fact, the conduction of excitations causing the ordinary sensations which are important only in the aggregate, is accomplished by means of the hidden fibrillæ which unite the condensed with the diffused system. On the contrary, some ways of direct communication between the two systems have been established physiologically for the special excitations before provoking a quick response, necessary and fatal. The easy propagation of the sensations thus allows the corresponding motor centers to readily respond."

The Land Molluscan Fauna of British New Guinea.—Last year Mr. C. Hedley had an opportunity of collecting and studying the land shells of this little-known region and has embodied the results in a paper published in the Proceeds. Linn. Soc. vol. vi. The author states that for the convenience of students he gives in his paper a summary of the knowledge of this fauna up to date.

The land shells of this province exhibit four rather distinct geographical divisions:

(a) The alpine fauna, whose sole known member is *Rhytida globosa.*

(b) The region lying between Port Moresby and the Fly River. The types in this region are *Hadra broadbentii, Geotrochus tayloriana* and *Helecina coxenii.* Mr. Hedley believes that the tropical Mollusca of Queensland were probably derived from this fauna, by migration across the dry bed of Torres Straits.

(c) A province which includes the eastern extremity of New Guinea with the outlying islands, of which the typical members are *Hadra rehseii, Nanina bunsteinii,* and *Geotrochus brumeriensis.*

(d) The Louisiade, D'entrecasteaux, Trobriand, and Woodlark Archipelagos. Characteristic forms are the Geotrochi allied to *louisiadensis* and the gigantic Pupinellæ allied to *grandis.* The author thinks that the occurence of *G. welsianus* and *P. brazieræ* on Fergusson Is. would indicate that the fauna of these islands will prove to be related to that of the distant Louisiades rather than to that of the nearer mainland.

Of the 110 species described by Mr. Hedley, 25 are new, and have been carefully figured, many of them magnified, to assist in identification.

The Pycnogonid Eye.—Mr. T. H. Morgan has been studying the structure and development of the eyes of Pycnogonids, and he sums up the results as follows:

"I believe all the layers of the Pycnogonid eye give abundant evidence that the eye has developed by the turning in of two sides of a primitive optic vesicle, and that the simple eyes of insects furnish all the intermediate stages, both in development and adult structure, between a simple cup-like invagination and the three layered condition of the Pycnogonid eye.

"I am inclined to push this a step further and attempt to show that the median Arachnid eyes have developed along a similar path, and this must be a necessary corollary to the position to which I have assigned the Pycnogonids, and believe, that the inversion of the Spider's eye in its Pycnogonid stage of evolution and the righting of it a secondary and later change. I also believe there is no evidence that in the evolution of the Spider's eye a change of position in the lens has taken place." (Studies Biol. Lab. Johns Hopkins Univ. vol. v. No. 1.)

Lateral Sense-Organs of Elasmobranchs.—At the meeting of the Royal Society of Edinburgh, Dec. 21, 1891, Prof. Corsar Ewart read the second part of a paper written by himself and J. C. Mitchell, on the lateral sense-organs of Elasmobranchs. In this part the authors deal with the sensory canals in *Raia batis*. It has been supposed that these canals serve for the production of mucus. The authors consider that this idea must be abandoned. They have observed a number of mucus glands in the skin sufficient to account for all the mucus found on the surface. They incline to the opinion that the canals have some respiratory functions. (Nature, Jan. 7, 1892.)

South American Siluroids.—G. A. Boulenger has published (Proc. Zool. Soc. Lond. April, 1891) an account of the Siluroid Fishes obtained by Dr. von Ihering and Mr. Wolff in Rio Grande do Sul, Brazil. The following is a list of the new species added to the Brazilian fauna: *Pimelodella eigenmanni* n. sp. n. for *P. buckleyi* E. & E. not Boulenger. 2, *Pseudopimelodus cottoides*, 3, *Otocinclus nigricauda*, 4, *Bunocephalus iheringii*, 5, *Trichomycterus minutus*.

Bunocephalus iheringii is interesting from the fact that no other species of the Aspredinidæ have so far been found south of the Amazons.—C. E. EIGENMANN.

The Spermatophores of Diemyctylus.—The fertilization of the Urodela has been until lately very imperfectly understood. The recent observation of Gasco and Zellu on European forms, and Gage's studies of Diemyctylus have proved beyond a doubt that fertilization is internal, but there is no direct cloacal contact between the sexes.

If a female newt be examined during the months of May and June spermatozoa will be found in the cloaca, not inside the mouth of the oviduct as might be expected, but closely packed in the ducts of two groups of gland-like structures situated in the cloacal wall just below the entrance of the oviducts. The question as to how the spermatozoa find their way to these snug resting-places is an interesting one. According to Mr. E. O. Jordan the explanation lies in what Pfeffer calls "positive chemotaxis." He thinks it probable that the pelvic glands of the female newt may secrete a substance—proteid or otherwise—with a positively chemotactic effect and thus draw the spermatozoa into its ducts.

During copulation both animals are motionless, sometimes for hours, with the exception of a fanning movement of the tail by the male, which is sometimes repeated by his mate. From this position the male passes gradually into a more violent stage, which has been wrongly stated by some authors to extend over the whole period. At the climax of agitation the male leaves the female, and with his tail slightly raised, his cloaca widely distended with numerous white protruding papillæ, waits for the female to follow him. If she does this and presses her head lightly against the cloacal region, the male deposits a spermatophore and then creeps on to a distance of a few centimeters, where, if the female still continues to follow him, he deposits another. Three is the number generally discharged.

"The spermatophore consists" to quote Mr. Jordan, "of three parts: a thick, irregular mass about six millimeters in diameter which adheres to the bottom of the aquarium ; a tough elastic spine projecting upwards from the base ; and, borne on this spine, an approximately spherical mass of spermatozoa about one and one-half millimeters in diameter, this mass being a sort of concretion of small balls of spermatozoa."

After the male has deposited the first spermatophore he moves forward with the female following him. In so doing she naturally brushes over the spermatophore and the mass of spermatozoa adheres to the cloacal lips and passes thence into the cloacal chamber. The chance of the spermatophore's fulfilling its mission is about 1 to 4.

It is difficult to understand why the spermatozoa choose to pass into the female cloaca rather than into the surrounding water unless a positively chemotactic influence is supposed. It is possible that the pointed spine in Diemyctylus may play an important part in the transaction. The elastic spine easily bent down by the female passing over it, and as easily springing up when the entrance of the cloaca is reached would seem adapted for effecting the entrance of the spermatozoa; but this is not the invariable mode of entrance. It more frequently happens that the spermatozoa are deposited on the cloacal lips and the surrounding skin so that the final conclusion of Mr. Jordan is that as in the European form reported by Zellu "the spermatozoa find their way to the 'Samentaschen' by virtue of their own activity." (Journ. Morph. vol. v., No. 2.)

A New Species of Wandering Albatross.—Sir Walter Buller has lately had an opportunity of examining sixteen examples of a supposed new bird, collected on the Aukland Islands and off the New Zealand coast, and has no hesitation in declaring it to be a distinct species, readily distinguishable from *Diomedea exulans* by its larger size, by its perfectly white head and neck from the nest to maturity, and by its having the bare eyelids jet-black, at all ages. This albatross being the noblest of the whole group, he selects for it the distinctive specific name of *Diomedea regia.* It nests earlier than *D. exulans,* actually hatching out its young in the Aukland Islands whilst the other species is only preparing to lay. (New Zealand Journ. Sci. 1891.)

The Temperature of the Dog.—Dr. Wesley Mills has been investigating the subject and has published the following results in Forest and Stream Jan. 28, 1892.

Range of temperature for the twenty-four hours.

Greyhound Dog (Two years old.)		Gordon Setter Bitch (About the same age.)	
Hours.	Temp. in degrees F.	Hours.	Temp. in degrees F.
10.00 A. M.	102.0	10.00 A. M.	101.4
12.00 M.	102.2	12.00 A. M.	102.2
2.00 P. M.	102.4	2.00 P. M.	101.7
5.30 P. M.	101.7	5.30 P. M.	101.9
8.15 P. M.	101.5	8.15 P. M.	101.6
10.30 P. M.	101.5	10.30 P. M.	101.6
12.00 P. M.	101.4	12.00 P. M.	101.2
2.00 A. M.	101.4	2.00 A. M.	100.8
4.00 A. M.	100.4	4.00 A. M.	100.7
6.00 A. M.	100.4	6.00 A. M.	100.8
7.40 A. M.	100.6	7.40 A. M.	100.5

The temperature was taken in the rectum in each instance for ten minutes. As the experiments were intended to be scientifically accurate, a self-registering thermometer with a Kew certificate testifying that the instrument was strictly accurate, was used. Such a one costs three dollars, but for ordinary work a good instrument can be secured at a lower price; nevertheless it does not pay to buy a cheap instrument.

The next table is the consecutive temperatures in one day for a Great Dane Bitch, eight months old.

Hours.	Deg. F.	Hours.	Deg. F.
8.30 A. M.	102.8	6.15 P. M.	101.7
10.00 A. M.	101.9	8.00 P. M.	101.1
2.00 P. M.	101.3	10.00 P. M.	100.5
4.15 P. M.	101.5		

It will be seen in this case the temperature in one instance reached almost 103 degrees.

The temperature in puppies is rather higher and decidedly more variable than in grown dogs. The following table for two English setter puppies of the same litter, nine months old, illustrates this less than it does the variations for the same breed and individual kept under precisely the same conditions:

Hours.	Temp. in degrees F.	Hours.	Temp. in degrees F.
8.30 A. M.	102.2	8.30 A. M.	102.5
11.00 A. M.	102.6	11.00 A. M.	102.4
2.00 P. M.	102.7	2.00 P. M.	102.5
5.00 P. M.	101.7	5.00 P. M.	101.9
7.00 P. M.	101.9	7.00 P. M.	101.9
9.00 P. M.	102.2	9.00 P. M.	101.6

It will be noted that the temperature in the case of one of these puppies reached 102 degrees, or higher, four times in twelve hours.

Zoological News.—Mollusca.—According to J. G. Cooper, the peninsula of Lower California has as yet yielded but 24 species of terrestrial Mollusca, 3 of which are Californian, while the rest belong to tropical groups but are in general peculiar to the peninsula. A curious fact to be noted is that 2 of the species occur in the similar arid regions of western South America and nowhere in the intervening moist regions. (Proceeds. Cal. Acad. Science, vol. iii., p. 1.)

Arthropoda.—Mr. Arthur Dendy has recorded observations that go to show that *Peripatus leuckartii* is oviparous. It lays its eggs in July and the young are hatched at the end of October. This is a singular departure from the habit of members of this genus, since in all the other species of Peripatus whose life-history is known the young are born alive. (Zool. Anz. Dec. 1891.)—According to W. W. Smith, *Pompilus fugax*, *P. monachus*, and *P. carbonarius*, the spider-hunting wasps of New Zealand, are never at a loss for food in their native land. The former, unlike many indigenous Hymenoptera, is slowly increasing in numbers owing to the abundant food supply.—(New Zeal. Journ. Sci. No. 3, vol. I.) **Vertebrata.**—The Congo Collection of fishes in the Zool. Mus. of Utrecht has been examined by L. Schilthins who thinks he is justified in regarding ten species and one genus as new to science. Descriptions, with figures of these novelties are published in Tidsc. Nederland. Dierk. Vereeing, 2d Serie, Deel III.—C. H. and R. Eigenmann report an addition of 21 species, 11 of which are new to the ichthyological fauna of San Diego. (Proceeds. Cal. Acad. Sci. vol. iii., Pt. 1.)—According to Mr. A. Butler the Carolina Parrakeet (*Conurus carolinensis,*) whose range is now confined to quite restricted areas in some of our Southern States, was formerly known as a characteristic bird of Indiana. At the time of its greatest range in that State, within historic times, it was known from New York, Pennsylvania and Maryland to Kansas, Nebraska, and possibly Colorado. (Auk. vol. ix., Jan., 1892.)—A series of tortoises found in Key West prove upon examination by Mr. Garman to belong with a specimen from Cuba described by him in 1887 to which only a generic name was attached. This tortoise is closely related to *Cinosterinum pennsylvanicum* and has been given the name of *C. baurii.*—M. C. Judson Herrick has recently published a paper entitled, Studies in the Topography of the Rodent Brain. The types chosen for these studies were *Erethizon dorsatus* and *Geomys bursarius*, partly because they seem to be aberrant members of the rodent stock and present striking peculiarities both in habits and general structure. *Erethizon dorsatus* is the only North American representative of the Hystricidæ. *Geomys bursarius*, the "pocket gopher" of the West, is widely separated from the other Myomorpha by its fossorial and nocturnal habit and the peculiarities of structure resulting from it. The paper is prefaced by one containing an interesting account of the habits of the Rodents under discussion together with those of the Muskrat (*Fiber zibethicus*), and some points in their anatomy more or less bearing directly upon their anatomy. (Bull. Sci. Lab. Dennison Univ. vol. vi. Pt. 1.)